GARDENS IN ALASKA

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GARDENS IN ALASKA

Home gardens are important in the economy and life of Alaska. Growing vegetables and flowers is a hobby enjoyed by both old-timers and new-comers in the far North. New and old alike are delighted by prolific and colorful blossoms, and by rapid plant growth during long summer days.

Many families raise vegetables to reduce their living costs and to relieve the monotony of shipped-in foodstuffs. Home freezers make a family garden a year-long source of food. An understanding of how to encourage plant growth lifts gardening from a chore to a pleasant experience in which the whole family participates.

BUYING SEEDS

The best success can be expected when vegetables recommended for Alaska are used. These are found in the annual "Vegetable Variety List." This list is available from your district extension agent.

Ask your local store for adapted varieties. If seeds must be ordered from a seedhouse, remember there is a rush of work at all seedhouses in the spring. Order early to make sure the seeds arrive by planting time.

PLANNING A GARDEN

When building a new home, the first step is to plan carefully and follow the plan.

Successful gardening needs the same kind of planning. If plans are put off until the last minute -- or neglected altogether -- the garden is helter-skelter, with too much or too little of everything, all in the wrong places. Good planning, proper selection of varieties, attention to weed and insect control, good fertilizer practices, and careful planting -- these all contribute to a successful garden.

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Make plans around the vegetables the family enjoys. Try new crops and varieties. Plant enough to supply the family all year. Some satisfaction comes from growing a little extra to give to the neighbors. A good garden returns the cash cost of the fertilizer, seed, maggot controls and labor. The pleasure of working in a pretty garden, and of eating high quality vegetables, are additional dividends.

Location. -- Few people have a large field from which to choose a garden site. All back yards may not be ideal, but most offer possibilities if properly managed. A well-drained sandy loam containing considerable organic matter is best and involves the least work. Heavy soils are generally wet, cold and hard to work. Light soils dry out quickly.

Those who must garden in either of these extremes may partially offset these adverse conditions. For example, heavy, wet soils are often improved by better drainage. An easy method is to work the surface into raised beds or rows. Raised beds promote drainage and

CLIMATE MAKES A DIFFERENCE

Southeastern Alaska is rainy and cool. Gardens need good drainage. Ridges and mounds help dry and warm soil. Tile drains and ditches are helpful.

In the Kenai Peninsula, summer temperatures are moderated by winds off the sea. Soil temperatures are low. Avoid mulches. Expose the garden to the sun.

The Matanuska and Tanana Valleys are dry in spring and early summer. Moisture must be conserved. Mulches are effective, although they encourage damage by rodents.

On garden sites at high altitudes, and in many places north of the Yukon, growing under plastic film may be necessary.

(Note: See Extension Circular 900, on "Building Plastic 'A' Frames" to cover the rows.)

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warm the soil. Light sandy soils often need more organic matter to promote water holding capacity.

Sloping Exposure. -- A good garden site is an open, gently sloping southern exposure. Although level areas are usually good, they are seldom as free from frosts as sloping land. Steep slopes erode and are difficult to work.

FACTORS TO FIGURE

How many people is the garden intended to feed? A 20′ x 50′ garden will supply vegetables for the average family of four.

What is the size of the area available? If less than the space required for the family, what vegetables will be left out of the plan?

What is the slope of the land? Avoid north slopes. Plant tall crops on the uphill side of south slopes.

What is the general nature of the soil -- sandy, loamy, dry or wet? Crops needing rich loam grow poorly on a dry sandy site.

Is the garden site more or less "frosty" than surrounding areas? Sometimes only a few feet difference in elevation adds to or subtracts many days from the growing season. If the garden is in a "frost pocket," plant only frost resistant vegetables.

Open areas are usually best because they allow sunlight to reach growing plants. Tall trees or buildings cast long shadows. Hedges and fence rows also detract from a garden area. Tree roots use moisture that otherwise might be available to the garden crop.

The garden should be near the house where it is convenient and easily reached.

Soil Testing. -- Have the soil tested. Samples may be submitted to any extension office.

Take representative soil samples from two or three places in the future garden. A half pint is sufficient. Place each sample in a separate container. Mark each container clearly to show where the sample came from. After the recommendations have been returned, follow them as closely as possible. Shipping bags are available from any extension office.

DO THIS:

Run rows east and west if possible.

Plant tall crops, such as wired or brushed peas, on the north side of the garden where they will not shade shorter vegetables.

Plant low vines on the outside edges of the garden, usually toward the south.

Plant cabbage, broccoli and other hardy vegetables in the lower parts of the garden where early frost is most likely to occur.

Allow ample space between rows and plants for broad-leaved vegetables like cabbage, cauliflower, broccoli, brussels sprouts, turnips, rutabagas and chard.

Plan consecutive plantings of rapidly maturing vegetables like radish and lettuce.

Plant beans in the lightest, best drained soil.

Make an actual scale drawing of the garden. THEN STICK TO THE PLAN.

FERTILIZERS PAY DIVIDENDS

A garden harvest is in proportion to the fertility of the soil, providing other factors are favorable. Alaska's soils -- like most other soils, even in Iowa -- need fertilizers for good yields.

The oldest and most common fertilizer is manure. If this is available, it can be used. Minimum applications of a half pound per square foot are recommended for Alaska. Newly cleared sandy soils need four times this amount.

If manure is not available, compost is a possible substitute. Compost is decomposed vegetable matter fortified with commercial fertilizers. An extension circular telling how to make a compost pile is available from your district extension office.

For many gardeners, common fertilizers made from inorganic materials are most convenient. They contain known amounts of nitrogen, phosphorus and potassium. Each package bears a label specifying its contents. A common method of naming fertilizers is by a number, such as 10-20-10. This number tells the amount of each element -- nitrogen, phosphate and potash, always in this order -- contained in the fertilizer. Each 100 pounds of 10-20-10 fertilizer, for example, contains 10 pounds of nitrogen, 20 pounds of phosphorus and 10 pounds of potash.

Most home gardeners apply fertilizer only in the row. Three pints (or pounds) of fertilizer on every 100 sq. ft. of garden area, worked into the top 2 inches of soil is recommended with an added cup of Ammonium Nitrate for each 100 ft. of row placed along the side in mid July.

For more details ask your district extension agent for a copy of " Fertilizers For The Home Gardener", No. 33.

REMEMBER

Fertilizers containing nitrogen or potash injure seeds in direct contact. Cover the fertilizer with soil before planting.

A label on a fertilizer sack or container tells what is inside. Read it to find out what you are buying.

Buy fertilizers that contain the most plant food for your money. Materials containing more than 40 per cent nutrients are usually good buys.

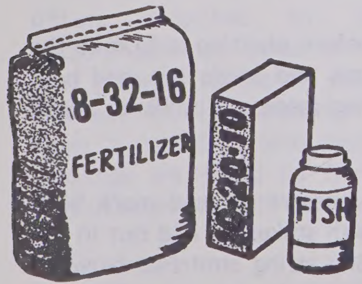
Gardens heavily fertilized in past years may give good yields even though less fertilizer is used than suggested in the recommendations. Heavier applications often pay dividends.

Use concentrated fertilizers like 8-32-16 or 10-20-10, or a home mix made of 50 pounds of ammonium nitrate, 80 pounds of treble-superphosphate and 80 pounds of sulfate of potash, all mixed thoroughly together.

Before planting potatoes broadcast 3 pints (or pounds) of the above fertilizer over every 100 square feet of garden area and work in to a depth of four inches.

Before planting vegetables and flowers, broadcast 3 pints (or pounds) of the above fertilizer over every 100 square feet of garden area and work in to a depth of two inches.

Commercial fertilizers are usually applied dry as they come from the bag. Professional gardeners sometimes spray fertilizer solutions on the leaves of their crops. This method is not recommended for beginning gardeners.



Beets, radishes, turnips, rutabagas, celery, cabbage, cauliflower and broccoli may grow better if a little boron is added to the soil. After plants are established, mix 1/4 teaspoon of borax in 3 gallons of water. Sprinkle on 100 feet of row. *Do not use more.* Do not use on beans, squash, cucumbers, or tomatoes.

STARTER SOLUTIONS

Alaska's short, cool growing season makes it important for all transplants to get a good start. This can be done by using "starter solutions." If poor weather slows down crops already growing rapidly, starter solutions may help start them growing again. They may be purchased or made at home. Most common are highly concentrated, entirely soluble chemical fertilizers and liquid fish fertilizers. One popular dry starter mix has the formula of 10-52-17. These should be used as directed on the label.

Other combinations may be entirely satisfactory. A solution can be prepared from whatever fertilizer is on hand. For example, mix a half cup of 10-20-10 in 12 quarts of water and allow to stand 24 hours. Stir again before using.

Pour about a cup of starter solution in each hole before the transplant is set. Setting the plant first and then watering often causes undesirable soil cracks.

Another effective starter solution is made by placing cow manure in a large container and adding water. Let this stand for a week or more, stirring occasionally. Use a pint to a quart around each plant.

MAKING A SEEDBED

Clear off all coarse surface debris and test the soil moisture before starting to work the garden. Test by squeezing a handful of soil into a ball. If it sticks tightly together, the soil is too wet. Wait a few days. A ball that crumbles easily shows it is safe to spade the garden. Most sites in Anchorage and the Matanuska Valley are dry and can be worked as soon as the frost is gone.

Small gardens can be spaded and leveled with a rake. A plot smaller than 10 x 20 feet seldom justifies "labor saving" machines. It is usually easier to spade a small garden than to start a cold gasoline engine.

Spade to a depth of 6 to 8 inches. Several small shovelfuls are better than one large shovelful. Each shovelful must be completely turned over and broken up. Since raking only smooths the surface, all breaking must be done with the spade.

Roto-tillers have rapidly moving blades that pulverize soil. They are increasingly popular with home gardeners. Decomposition of organic matter is very slow in cold soils, and the roto-tiller helps break up coarse material. Very little additional smoothing is needed on properly roto-tilled soils. The extremely loose surface layer rapidly dries and warms. This is good in wet sites but may be bad on dry sites. Most soils must be packed after roto-tilling.

Large gardens can be plowed and harrowed. Or they may be disked. Large roto-tillers are used by some farmers, and may be available for custom work.

In areas protected from high winds, heavy soils may sometimes be plowed in the fall, although this practice is not always an advantage. In general, spring is the best time to prepare the seed bed. By not disturbing the ground in the fall, moisture, nutrients and topsoil are saved.

PLANTING THE GARDEN

A final step before planting is to rake the surface. Raking firms and levels the seed bed. This helps in planting seeds at a uniform depth below the surface.

After raking, measure off and mark both ends of each row with stakes, as laid out in the garden plan. A strong string stretched between stakes serves as a guide to keep rows straight and neat. Small gardens are easily planted by hand.

On shallow rooted crops like celery and onions, it is better to use several light applications of fertilizer rather than one heavy one.

Shallow furrows are made with the end of a hoe or rake handle. Deeper furrows are made with the corner of a hoe. If fertilizer is to be spread in the bottom of the furrow, it is necessary to dig somewhat deeper than the seeds will finally be planted. Fertilizer must be entirely covered with soil so that it does not come in direct contact with seed. It is usually better to drop the fertilizer 1 1/2 to 2 inches to the side of the row, so that the tap roots will not have to grow down through the concentrated material.

TREATING SEEDS

When the seed sprouts, the young shoot is often attacked by fungi and other micro-organisms. Some of these soil organisms start growing before the seed sprouts. They are all ready to attack it as the tiny sprout emerges from its protective seed coat. In wet soils many seedlings are killed by these micro-organisms. This disease is called "damping-off."

Several materials to control damping-off are now available. Some seed companies make a regular practice of treating seeds before they are packaged. For several years, packets of seeds displayed in many Alaskan stores have been marked "Treated with Spergon" (or some other protectant). These seeds are well worth buying. They cost no more than untreated seeds.

If treated seed is unavailable, a gardener can treat his own by buying an ounce or so of Spergon or Arasan at a garden supply house. Into each 1/4-ounce seed packet insert as much of this material as can be held on the end of a toothpick. Shake the packet and the seed is treated. A pound of peas or beans takes about a half teaspoon.

Spergon and Arasan should not be left where children may get at them. If any is left over, it should be burned, rather than stored in a cupboard where it may be mistaken for something else. "Semesan," a mercury compound, is very poisonous and is not recommended for home gardens.

Most small seeds like radishes are covered not more than a half inch deep. Very small seeds like lettuce need even less soil over them. Larger seeds such as beans and peas may be covered about an inch deep.

Seeds should be spaced apart at least four times their diameter. A common error is to plant too many seeds. A healthy lettuce plant, for example, eventually needs at least 12 inches of space. Why plant 100 seeds where only one will grow well?

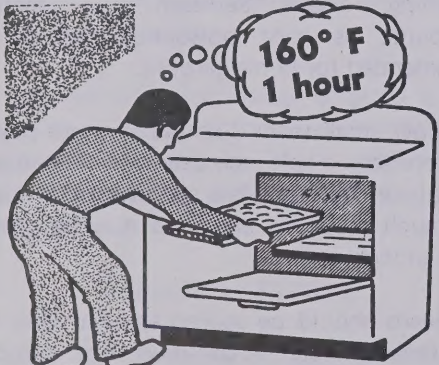
A properly planted and covered seed is firmly in contact with moist soil, deep enough to avoid washing out, but not so shallow that it dries excessively.

GROWING TRANSPLANTS

A warm, sunny window, some well-prepared soil and a starting box are the principal materials needed to start all the early vegetable plants a family can eat.

Soil for starting transplants is taken inside before the fall freeze-up and stored for spring use. One part garden loam, one part sand and one part peat, all well mixed and screened, make an excellent mixture. The soil may be heated or treated with chemicals to partially sterilize it. This helps control damping-off.

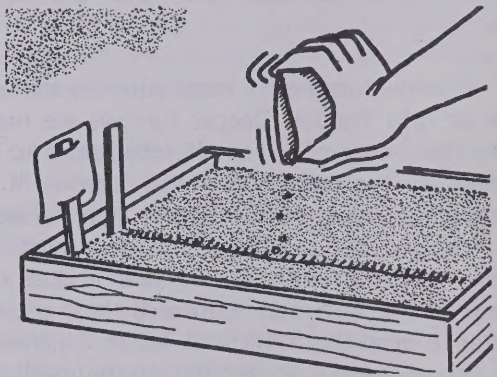
To sterilize with heat, spread an inch or so of soil in a broiler pan or cookie tin. Place these shallow pans of soil in the oven and heat for one hour at 160-180 degrees.



Another method is to dilute 1/4 cup of formaldehyde in a gallon of water. Drench the flatful of soil with this solution. Cover with a paper or piece of aluminum foil. Let stand for at least a day. Then remove the cover and let the soil dry out. This will take two weeks or so. This method disinfects the flat, too. Do not plant in this soil for at least two weeks or the seeds may be killed by formaldehyde.

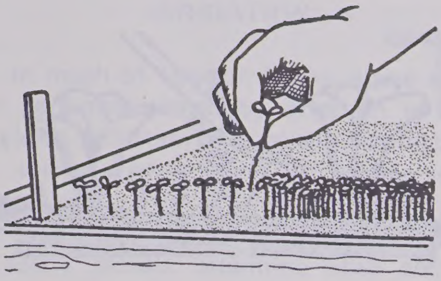
Flats. -- Convenient flats are wood boxes about 12 inches wide, 18 inches long and 3 inches deep. The exact size is not important, except they should not be too heavy. Damp soil is heavy and large flats are difficult to handle. Shallow cans or pans are good if holes are punched in the bottom for drainage.

When filling flats, firm the soil along the edges. This prevents a crack next to the sides where water can run out without benefit to the soil. Fill to within 1/4 inch of the top with the prepared soil. Firm slightly after leveling. Make rows two inches apart and 1/4 inch deep across the flat. A narrow board cut to fit the flat is a good row marker.



Seeding flats. -- Sow treated seed as instructed on the packet. Small seeds are sown evenly and rapidly from the lip of packet. Larger seeds are planted individually. Do not sow too thickly. A good rule for small seed is eight to the inch. Cover the seed evenly and lightly. Firm the soil over the seed only enough to make good contact. Sprinkle the surface with a fine spray. Cover the flat with paper or glass to retain surface moisture. If paper is used, remove it as soon as the seedlings start breaking ground. Glass has the advantage of providing a little extra protection against drying and cold drafts for a day or two after the sprouts come up.

The first few days after emergence influences the growth of new plants throughout



their life. If the flat has been filled and seeded as suggested, air circulates around each plant. This is important in preventing damping-off.

New roots and shoots are extremely tender. The seed itself contains enough food to grow until its first leaves are formed. Avoid fertilizing until the first true leaves start to appear. Then apply starter solution or liquid fish fertilizer sparingly.

After the first true leaves have developed, some rows will be too crowded. Start at one end of the flat and systematically thin out each row until there is 1/4 inch space between plants. This spacing lets air circulate around each seedling. It makes transplanting much easier.

To save space new plants are often grown for two weeks or more in their original seeding flats. If space is available, seedlings should be transferred to individual containers or to other flats soon after their true leaves appear. Spaced two inches apart, plants will grow until the garden is ready for them.

An occasional watering with starting solution or fish fertilizer will keep them growing. A good transplant is about six inches tall when setting time arrives.

Hardening. -- To reduce transplanting losses, plants should be "hardened off" in the flats. This is a period of adjustment from the warm, moist house to the rigorous weather of the garden. About 10 days before transplanting time start withholding water.

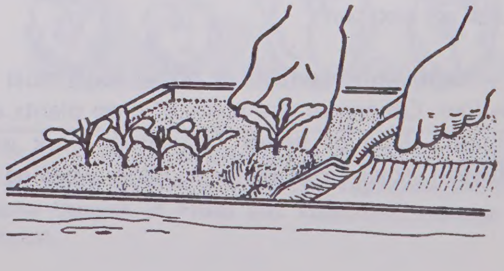
Carry the flats outside for two or three hours during the warmest part of the day. They must be partially shaded from direct sunlight. Lengthen their time outside by about an hour a day. Gradually reduce the amount of shade until at the end of ten days they are out all day long.

When transplants are grown in flats, about two days before setting them in the garden, cut both ways between the rows with a sharp knife. Then water thoroughly. Many small roots are cut off each plant in this operation. Root pruning two days or so before transplanting gives them a chance to recover a little before exposure to sun and wind.

Transplanting. -- Transplanting is best done in the late afternoon. This gives the roots time to adjust themselves before the next day's sun.

First mark the location where the plants are to be set. Allow ample room. Although they look small they will soon need plenty of space to grow. See the chart on page 20 for suggested spacing. The corner of a hoe can be used to dig holes. One or two motions will dig a hole about the right size for a 2 x 2 inch soil ball.

When all is ready, LIFT the transplants FROM THE BOTTOM. DO NOT PULL. Place about a cup of starter solution in the hole and set the plant at once. Do not fill a lot of holes ahead with starter solution. Fill them just before the plant is set. Firm the muddy soil around each plant as it is set.



When all the plants are in place, shade them for at least a day. This can be done with newspapers, or old boards. Remove all shading material as soon as the new plants become established.

Hot caps. -- Hot caps are miniature greenhouses. They are cones of weather-resistant paper placed over individual transplants for heat and protection. Slow starting seeds may also be planted under hot caps. In areas where late spring frosts are common, hot caps protect the tender plant, giving some insurance of survival.

Center the cone over the plant, making sure there is no contact between plant and the paper. Place soil around the base of the hot cap to hold it in place and eliminate air leaks.

Keep a close check on plants covered with hot caps. Heat builds up rapidly under these protectors. Plants are damaged if prolonged bright sunlight raises the temperature too much. Check the weather reports. Remove the caps if frost is not expected, or during the heat of the day.

WEEDING

Weeds use nutrients and moisture that crops need. They must be controlled from the very start. The worst garden pest is chickweed, although lamb-quarters, plantain and shepherds purse are also bad.

Cultivation by hand or power tools must be shallow. Otherwise the roots of crop plants are injured. Hand or power cultivators work well between rows. Hoeing and hand weeding is needed around and between plants in the row. Start when the first weeds are above ground. Keep at it until the last weed seed has germinated. Weeds germinating in August sometimes set seed before freeze-up.

Commercial gardeners use chemicals to control weeds. Although carrots are easily weeded with chemicals, in general chemical control is not practical for the beginning home gardener. Both the crop to be grown and the weeds to be killed must be considered before a herbicide is selected. Chemical weed control requires spray equipment and a variety of materials.*

Mulch between rows of vegetables has been tried for many years as a weed control. For those who are away for long periods this method has some merit, except where soil temperatures are as low as on the Kenai Peninsula. Mulch retards weed growth and conserves moisture. Mulch has more value after row crops are well advanced so they are not smothered by the mulch.

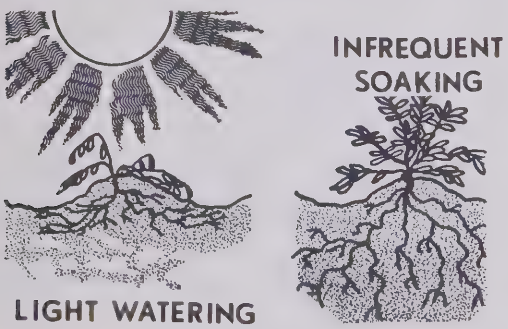
Ordinary newspapers or building papers smother weeds but do not stand up against adverse weather. Black plastic sheeting has been used with some success by home gardeners. It shades out weeds and sheds water toward the plant row. It also lowers the soil temperatures by holding so much more moisture below it.

IRRIGATION

In much of Interior Alaska sparse rainfall must be supplemented by irrigation to insure top yields. Irrigation is especially helpful during dry springs when lack of water delays germination.

Many factors determine when and how much water should supplement natural rainfall. Light, sandy soils lose water quickly and need frequent irrigation. Heavy soils and soils high in organic matter hold water for a long time and therefore need less irrigation. The gardener has to decide about his own soil.

The second consideration is weather. Cooler weather means less loss by evaporation and transpiration. This reduces the demand for moisture. Hot, dry, clear or windy weather increases the need for irrigation.



Although well water and river water is cold, it does not greatly influence plant growth. Warm water is best, but cold water is much better than none at all. An old, clean oil drum filled with water will warm 20 degrees or more. But the extra labor of handling water twice is usually not returned in greater crop response.

Few large fields in Alaska are level enough for furrow irrigation. A small home garden may, however, be ideally watered by a system of connecting furrows. Commercial growers use pipe and sprinkler heads. A sprinkler system is large and probably not economical for home gardens unless a pressure system is already serving the household.

Soak the soil whenever the root zone is dry. A few heavy waterings are better than more frequent light watering. Light frequent watering encourages shallow roots. To tell when to water, test the soil by squeezing a small handful. If it does not hold its shape when released, water is needed. When the soil holds its shape but crumbles easily, there is still some moisture available for plant growth. The test should be made daily from then on. If the soil ball sticks firmly together, there is ample moisture for several days. When plants show signs of wilting, water at once.

HARVESTING AND STORING

Vegetables should be harvested at their prime. Do not wait until they are overmature. Harvest only the best for canning or storing. Crops are never improved by storing. Handle vegetables gently. Clean completely and put them into a cool place at once. Do not take more than can be prepared at one time.

Home freezers have simplified the storage of many vegetables. They make garden fresh crops available all the year around. Canning still is a good way of serving many vegetables.*

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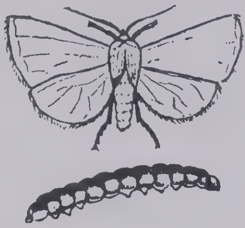
*Both methods are fully described in USDA Bulletin G-10, Home Freezing of Fruits and Vegetables, and G-8, Home Canning of Fruits and Vegetables, available on request.

Potatoes, carrots, cabbage and even celery are stored in a cool basement or cellar. A cool corner in the basement, or a properly ventilated hole under the house floor is satisfactory.

CONTROL OF INSECTS



Alaska is relatively free of insect pests, except mosquitoes that pester the gardener. Only two are common. These are apt to be most troublesome in the Tanana and Yukon Valleys where summer temperatures are warm.

Cutworms.** -- Cutworms are the larvae of small moths. Many species are found in Alaska. Color and markings are variable. They feed below the surface of the soil and sometimes above the ground. Most damage is done from late May to mid-June.

Root maggots.** -- Onion maggots, seed corn maggots and turnip maggots are common in Alaska. The last is most widespread and usually does the most damage. They attack turnips, cabbage, cauliflower and broccoli from late May until July.

Avoid greenhouse pests by raising plants from seed. When plants are imported, isolate them and examine them carefully. If aphids or red spider mites, whiteflies or others are discovered. Follow recommendations in "Controlling Vegetable Garden Insects."

**See Extension Publication, "Controlling Vegetable Garden Insects."

VEGETABLES FOR ALASKA

Asparagus. -- This perennial vegetable grows in favorable locations in the Tanana Valley. A few plants along the south side of a house next to the foundation may yield several meals for the family. Asparagus is a heavy feeder and demands ample water.

Roots or crowns are ordered from seed houses. A good variety is Mary Washington. Set roots 5 to 6 inches deep and cover with about one inch of soil. Continue this practice as the shoots appear, until the soil is level.

Do not cut shoots the first year. The second year cut only the first shoots. Let the tops grow. Thereafter, asparagus may be cut sparingly. Tops should be allowed to grow six weeks or so before fall frosts.

Beans. -- Although beans are a marginal crop in much of Alaska, both green podded and wax podded varieties are popular. In most places the season is long enough but cold soil temperatures retard growth and beans may not mature. Yields are good during warm summers. Good harvests can be expected three years out of five in the Matanuska Valley. Beans seldom do well south of Anchorage. Fair crops can be expected every year in the Tanana Valley.

Light, well-drained, sandy soils are best for beans. Light applications of commercial fertilizer are needed. However, too much fertilizer causes the blossoms to drop off.

Beans freeze easily. Early plantings must be protected at night when the temperature falls to near freezing. Set a temporary "ridge pole" a few inches over the bean row. Then cover with newspapers.

In warm soil beans germinate in three or four days. Cool soils or cold weather may delay their emergence 10 days or more. Do not cultivate after the blossoms appear. Paper or grass mulch helps keep weeds down at this time. Avoid working in beans when they are wet.

Beets. -- Beets are hardy and not harmed by light frosts. They would do well in Alaska except for one shortcoming -- their biennial habit (growing one season and seeding the next) is sometimes thrown out of balance by long days. They often blossom and set seed the first year without growing a good root. When beets start to bolt they are always of poor quality. There is no way to stop beets from blossoming once they have started. Recommended varieties do not bolt as much as those not recommended for Alaska. Late planting and thinning reduces bolting.

Soil requirements are not critical. A fairly deep friable loam is best. It must be well-drained and fertilized heavily for rapid growth.

A beet "seed" is really a cluster of seeds. For this reason beets must be thinned as soon as their first true leaves have grown. Pull all the extra little beets, leaving only one of each cluster. Space them about an inch apart. In a month the tops will be eight inches tall and the beets an inch in diameter. They must now be thinned again, leaving plants at 4 inch intervals.

Use the thinnings for greens, cooking both tops and roots. Frozen beet greens are excellent. For best quality, use beets when they are two inches in diameter.

Cultivate only enough to kill weeds. After beets are about half grown, mulching between the rows usually increases yields more than additional hoeing.

Two plantings can be made in many places. The first is made when the garden is first planted. The second planting should be made in early July.

Broccoli. -- Broccoli, like other cole crops, is hardy and grows best in cool weather. It is particularly well adapted to Alaska, as are cabbage and cauliflower.

The terms "Broccoli" and "green sprouting broccoli" refer to the same plant. "Broccoli" was originally a large cauliflower. Unopened flower buds form the "head" of broccoli and the "curd" of cauliflower.

Broccoli may be seeded directly in the garden or started early in the house. Start transplants early in flats. A dozen plants are enough for a family of five. Broccoli must be protected against maggots and cutworms.

Harvest the central or terminal head before the buds start to show yellow. New lateral heads will continue to form. These must be harvested continuously for sustained yields. Broccoli is an excellent frozen vegetable, high in both vitamin C and A.

Soil requirements are not critical but plenty of moisture and fertilizer is needed. Sidedress with nitrogen twice during the summer.

Brussels Sprouts. -- Buds form little heads where the leaves join the stems. These are the edible part of this plant. These miniature heads taste somewhat like cabbage. They freeze well, or may be canned or pickled. Because of their small diameter, brussels sprouts dry out quickly when stored in the basement. This vegetable may be started early and transplanted like cauliflower, cabbage or broccoli, or it may be seeded directly in the garden, although direct seedings are usually very late.

Brussels sprouts mature from the bottom toward the top. Use the sprouts as they reach an inch in diameter. These plants stand severe frosts and persist until late in the fall.

Like most of the cabbage family, rapid growth gives best quality. Ample water and fertilizer is needed throughout the growing season. Seedlings and transplants need protection against cutworms and maggots.

Cabbage. -- Cabbage may be seeded directly in the garden or grown from transplants. Transplanted cabbage make a somewhat more solid head than those directly seeded. Plants are usually spaced 15 inches apart in the row.

Early cabbage is seeded in flats at least eight weeks before they are to be set out. Cabbage is resistant to frost. It grows well in cool soils. When air temperatures are low, moisture seems to be the most important factor to good growth. Cabbage grows on sand, muck or heavy soils. Early crops are obtained on sandy soil. At least two sidedressings of good commercial fertilizer or ammonium nitrate gives top yields of high quality cabbage.

Cabbage must be protected against cutworms and maggots.

Carrots. -- Carrots do best in sandy loam. Heavy, wet or stony soils cause misshapen carrots, and give poor yields. Carrots need a lot of potash. Extra potash in the fertilizer is worthwhile.

Carrot seeds germinate slowly. A good practice is to plant a few radish seeds to mark the rows so they can be hoed to keep down weeds before the carrots are up. Deformed carrots means the soil is too compact or the seedlings not adequately thinned.

Thinning is very important. Carrot seed is usually planted too thick. Before the plants are an inch and a half high, pull out most of them, leaving one plant every 2 inches.

Chickweed must be killed early or the slow starting carrots will be completely smothered.

Carrots will store all winter in clean sand. Place an inch of sand in a clean wood box. Then put in a layer of carrots. Cover with sand. Then cover the top layer with three inches of sand. Store at cool temperatures but do not freeze.

Cauliflower. -- Cauliflower is not as hardy as cabbage or broccoli. Cauliflower must be well watered and heavily fertilized for rapid growth. Like brussels sprouts, cabbage and broccoli, cauliflower is started early and transplanted. Or, it may be seeded directly in the garden for a late crop. Cauliflower needs protection against maggots and cutworms.

For home use plants with heavy foliage need not be tied. For commercial sale white heads are demanded, and shading by tying the central leaves together is necessary. Freezing, canning and pickling are common means of preservation.

Celery. -- Celery is hard to grow, although it is well suited to many Alaskan sites. In the other States, the best celery is grown on muck. In Alaska, muck soils are usually too cold and frosty. Better drained garden sites are less subject to frost. Celery grows well on silt and sandy loams if ample water is available. Celery should not be grown unless the gardener is prepared to water it.

Celery grows slowly. It starts slowly and ten weeks or more are required to grow transplants. As the plant gains size its rate of growth speeds up. Celery is shallow rooted and a heavy feeder. Careful soil preparation and liberal applications of fertilizer are required. Fertilizer should be applied in several light applications. Potash is important, the requirements being four times that of nitrogen and about twice that of phosphorus.

Home gardeners usually purchase a couple of dozen transplants for a family of four. A fairly skillful gardener can grow his own transplants, although they must be seeded in March and require much careful attention.

Celery can be stored for several weeks in a cool cellar. Take up the entire plant, crown, roots and all, and place it in an upright position in moist sand. Roots and tops may be pruned a little after digging. Avoid wetting the stems of stored plants.

Chinese Cabbage. -- This is a good salad vegetable. Early plantings usually go to seed before heading. Later plantings sometimes yield a few firm heads. Other than going to seed, growing chinese cabbage is no more difficult than growing lettuce. It is seeded directly in the garden. Thin out to one plant every 4 or 5 inches while small.

Chives. -- The grass-like, hollow stem is good in salads and for flavoring meats and vegetables. Plants are started from tiny sets.

Chives are perennial. A single plant along the south wall of the house near the kitchen door is enough for a family of four. When large enough it can be divided into several plants. A portion can be potted and grown during the winter on the window sill.

Collards. -- This green is well adapted to Alaska. Freezing does not seriously injure collards. They look like unheaded cabbage, and their culture is the same as for cabbage. They do well on poor soil if given ample water. Collards yield heavily. A ten-foot row is enough for a family. Thin out to 15 inches or so.

Corn. -- Sweet corn is not satisfactory in most of Alaska. On the other hand, most gardeners try to grow corn, just to prove it can be done. In Anchorage, the Matanuska Valley, and the Tanana Valley, and even in some parts of the Yukon Valley, a few roasting ears can be grown in favorable sites. Perhaps more important than the actual harvest are the pictures to send "Outside."

Dwarf bantam varieties are most likely to set ears. The plants can be started in small cans or pots in April or May. Plant three kernels in a No. 2 tin. Wait until June to transplant. Be careful not to injure the top or roots when transplanting. A little fertilizer helps, but what corn needs is hot sunshine -- which is infrequent in Alaska. The south side of a house is apt to be warmer than an open garden. Growing corn in the field under clear plastic has met with some success.

Fairly good roasting ears have been grown in greenhouses. Corn is not a profitable crop, however, and expensive greenhouse space will grow more food if planted to other crops.

Cucumbers.* -- Like corn and tomatoes, garden cucumbers are usually a novelty in Alaska. Fairly good pickles have been grown in selected sites in the Tanana and Yukon Valleys where summer temperatures are relatively high. There are no varieties well adapted to the cooler summers south of the Alaska range. The gardener's efforts yield more food if he grows something else.

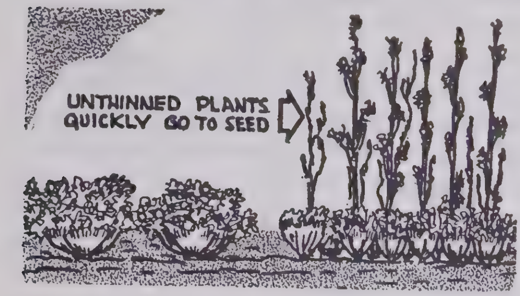
For those who wish to try new varieties and new sites, the plants may be started indoors in May. The shock of transplanting is severe and most plants will not survive. A better method is to build a small hotbed, covered with a storm window (seldom needed after April.) Plant a half-dozen seeds and keep the weeds down. Let the vines outgrow the bed when warm weather arrives.

A site on the south side of the house is good. The vines may be trained up strings or a trellis.

Eggplant.* -- This is not a garden vegetable in Alaska. Eggplant does well in greenhouses.

Endive. -- Endive is like lettuce. It sometimes bolts to seed without growing edible leaves. Late planting and early thinning helps discourage bolting. A row 20 feet long is enough for most families. Plants must be thinned early, before they are two inches high. Space them about 10 inches apart in the row.

Some people prefer blanched endive. To do this wait until the plant is full grown. Then bring the outside leaves together and tie them at the top. Do not tie when the plants are wet because they will decay.


UNTHINNED PLANTS QUICKLY GO TO SEED

Kale. -- This green does well in Alaska. It grows in any good garden site. Leaves must be picked young for top quality. Kale is very nutritive, containing Vitamin A, thiamine and ascorbic acid. It is sometimes grown as an ornamental.

Kale is cared for like cabbage. It grows fast and is seeded directly in the garden. A 20-foot row is adequate for a family. Thin to a single plant every 12 inches.

Kohlrabi. -- The edible part of kohlrabi is a bulblike swelling of the stem above ground. It has a mild, turnip flavor and is eaten raw or cooked. Being above ground, root maggots seldom penetrate the edible portion. Kohlrabi withstands frosts and grows rapidly. It is a good vegetable for Alaska.

Kohlrabi is grown like cabbage, planted directly in the garden. Thin to 6 or 8 inches. Kohlrabi becomes woody when bigger than two inches. Trimmed Kohlrabi stores for long periods with little care.

Lettuce. -- Leaf and head lettuce are sown directly in the garden. Successive plantings every two weeks produces a continuous supply. There is no practical way to store lettuce.

For early head lettuce, seedlings may be started in the house and transplanted in late May or June. Rapid growth for good quality is assured by liberal applications of fertilizer. Do not crowd lettuce in the row. Thin both leaf and head varieties. One plant every 12 inches is thick enough.

Mustard. -- A 10-foot row of mustard greens yields excellent early greens for a family of four. High in calcium and iron, a little chopped mustard adds flavor to spring salads. Mustard greens are easily canned and frozen.

Seed directly in the garden and thin to one plant every 6 or 8 inches in the row. Mustard sets seed rapidly. These seed may come up the next year. In some favorable sites, seedlings may be hard to kill. For this reason, pull the plants when they start to blossom. At this stage they are not good for greens.

Onions. -- Onions do well on a wide range of soils if plenty of moisture is available. Soils high in organic matter and rich in nitrogen are ideal. Onions are very shallow rooted. Great care must be taken not to cut off the roots when cultivating.

Dry onions are commonly started from sets (small onions) while green bunching onions are grown from seed. Place the sets in a very shallow trench. Space 2 or 3 inches apart. Cover to their necks. Do not bury them completely. Weeds should never be allowed in the onion row.

Damp fall weather in much of Alaska slows down the maturing of dry onions. Bending over their tops when they have reached a suitable size hastens maturity. After pulling, shake off the dirt and let the bulbs dry. Then rub off the tops and roots. Store in a dry, cool room.

Parsley. -- This cool season crop is used for garnish and seasoning. Seeds germinate slowly. If planted alone in a row, they are usually smothered by weeds before the gardener sees the small plants. A few parsley seeds scattered in the radish row usually yields enough for a family. No special culture is required. Parsley may be dried for winter use. It may also be potted and kept alive in the house during the winter.

Parsnips. -- Parsnips are a delicious root crop. They are grown like carrots. Like carrots they emerge and grow slowly. Rows are usually marked with radishes to make early cultivation easier Plants must be thinned so that each has 3 or 4 inches of space in the row. Parsnips are improved by freezing. Once frozen they should not be thawed until cooked. Some gardeners leave a few in the ground until spring.

Peas. -- Peas are one of Alaska's most satisfactory vegetables. They thrive in cool moist weather and are not bothered by diseases and insect pests. They outgrow most weeds. Long days encourage early blooming. A good crop is obtained with little trouble. When sidedressed with nitrogen, most good pea varieties bloom and set pods until early September. Picking and shucking are more trouble than growing them.

A row 100 feet long takes a pound of seed and yields about 25 pounds of shucked green peas -- enough for most families. In sites where damp weather is expected in August, pea vines should be trained to a fence of woven wire or brush. This makes picking easier. Pods of unsupported vines lie on the ground and may rot during wet weather. If the garden rows run north and south, a row of peas can be planted about six inches on each side of a woven wire fence. Where rows run east and west, plant only on the south side of the fence.

To plant peas, dig a furrow about two inches deep. Spread about two pints of fertilizer in the bottom of the furrow, down the length of the 100-foot row. Then partially fill the furrow with soil. Now scatter the pea seed down the furrow. The seed should lie on the soil above the fertilizer. Cover the seed with another half inch of soil and pack by tamping with the rake or hoe. Tamping insures good contact between the seed and moist soil. A good stand of peas should have plants every inch.

After the vines are six inches high, scatter another two pints of fertilizer down the side of the 100-foot row. Wait until the vines are dry to do this. Otherwise some fertilizer will stick to the wet leaves and burn them. Now push dirt up against the vines so they are inclined toward the fence, where their tendrils can reach the wire or brush. Another sidedressing of fertilizer in early August will keep vines growing until frost.

Good healthy pea vines may reach up three or four feet on the supporting fence. Sometimes they are so heavy, their tendrils are broken and the vines fall to the ground. To prevent this, tie the vines to the fence with strips of cloth, string or wire, looped at 6- or 8-foot intervals through the fence mesh.

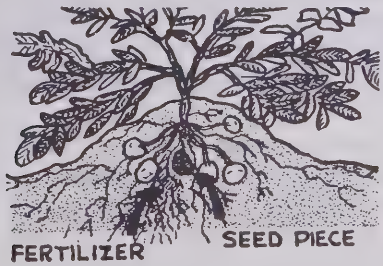
Start picking peas from the bottom, as the pods fill. Take them before the pods wrinkle or turn yellow. When picking for freezing, take only good pods. Leave old ones (containing hard peas) and young ones (containing undersized peas) on the vine. As the peas are shucked, grade them again, so that only peas of the same size and age are blanched or canned.

Peas are easy to freeze or can once they have been picked and shucked. Old pods may be left to dry on the vine. Dried peas can be stored for soup or for baking like beans.

Potatoes. -- Potatoes need lots of space. If the home garden is small, a few hills yield enough for fresh "peas and potatoes." Potatoes need loose soil for best growth. A row 100-feet long with plants spaced 12 inches apart takes 15 pounds of seed. About 150 pounds of potatoes can be expected.

The easiest way to plant potatoes is to dig a furrow about four inches deep. Scatter about three pints of fertilizer down the bottom of the furrow. Then rake back an inch or so of soil. Drop the seed a foot apart, a little to one side of the fertilizer. Cover with an inch or so of soil and walk on the row to pack it down. In warm weather, the plants will emerge in a week or 10 days. Cool weather delays emergence.

As the plants grow, rake soil around them. When the vines are a foot high the row should be "hilled" (soil piled over it) 2 or 3 inches higher than the rest of the garden. Hilling kills weeds and buries the new tubers so they are not exposed to light. New tubers turn green when not covered with soil. Green tubers are apt to be bitter.



Small potatoes an inch or so in diameter make good seed. Larger potatoes may be cut into several pieces so that each has at least two "eyes." There is no advantage in planting large whole potatoes. Sometimes peelings are planted. They usually make weak, slow growing vines because parings contain little food and moisture.

If the family depends on growing potatoes, certified seed is needed every 2 or 3 years. Certified seed does not contain diseases, especially ring rot, which is apt to spoil stored potatoes before they can be eaten. Seed from home grown potatoes can usually be planted for at least two years. Small potatoes can be saved for seed.

Seed can be bought from commercial potato farmers. If the source is known, good Alaska potatoes from the grocery store make good but expensive seed. There is a possibility that potatoes bought from a grocery store may have been treated with sprout inhibitors. These keep tubers from sprouting so they are not good for seed.

Some gardeners, especially in Scandinavia, like to green sprout their seed potatoes. They cut their seed and spread them out in a light warm place about 10 days before planting time. Little green sprouts about a quarter of an inch long grow out of the eyes. If these sprouts break off during planting, the work of green-sprouting is lost. Green sprouting hastens emergence but does not necessarily make an earlier crop.

After the tops are killed by frost, potatoes can be dug. They are not good if they freeze and thaw in the ground, however, if potatoes can be kept frozen until they are used they are suitable for eating though they are very sweet. Wash or brush dirt from the tubers and store in a crate or wooden box that has cracks and holes in it for ventilation. A cool basement is a good storage area. A storage temperature of 36 to 38 degrees Fahrenheit is best.

Radishes. -- Radishes grow rapidly. Plant only a few feet of row at a time, every week until August. Radishes must be protected from maggots. Thin so each plant has an inch or so of space to grow in. Use while small. Pull old plants before they blossom.

Rhubarb. -- This perennial grows well in Alaska. The leaf stalks cut into chunks and boiled in sugar for a few minutes make a good dessert. Packed into a plio-film bag, they can be frozen without blanching. Five or six plants supply a family, with some left over for the neighbors. One or two plants close to the south foundation of the house will provide a dessert once a week throughout the summer.

The best way to start rhubarb is to buy several roots from a nursery or get some from a friend. Plants with deep red leaf stalks are superior to green ones. A large plant can be cut into several smaller ones. Dig up the old root and separate it into several pieces, leaving one or two buds on each.

Select a site outside of the garden area, where the plant can grow undisturbed for several years. Inside the garden, rhubarb grows so big it is a nuisance to work around unless a whole row is set aside for it. The site should be well-drained, but not gravelly.

Dig a hole a foot or so wide and a foot deep. If manure is available, spade a pailful into the bottom of this hole. If manure is not at hand, spade a cupful of commercial fertilizer into leafmold or well decomposed organic matter. Place the roots well down. Fill in with soil so the crown of the root is level or slightly above the surface. Pack soil around the edge of the hole leaving a depression to hold water. Pour in a bucket of water and then mound the remaining soil over the crown.

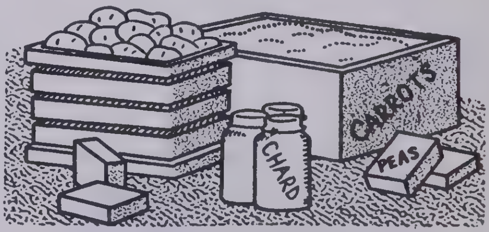
Good juicy rhubarb needs lots of fertilizer. Sidedress old plants with a pint of commercial fertilizer, scattered over a 3-foot area, in early May. Scatter another cupful around the plant in early July and again in late August.

Newly set plants should be left undisturbed for a year. The second year they may be lightly harvested. Rhubarb goes to seed. Unsightly flower stalks may be cut without harming the plant.

Rutabagas. -- Rutabagas are grown like turnips. They need more space in the row. Thin to 8 or 10 inches. Their quality improves in a cool, moist storage, preferably just above freezing. Storage life of rutabagas is extended if they are cleaned and waxed when pulled.

New Zealand Spinach. -- True spinach goes to seed so quickly in Alaska's long days that it is not recommended for home gardens. New Zealand spinach is better adapted. It can be grown in nearly all areas. A trial planting of perpetual or beet spinach is worthwhile.

New Zealand spinach is grown like beets. Seedlings are thinned 15 to 18 inches apart in the row. Young tender tips of branches are harvested. They are eaten fresh or boiled. They may be canned or frozen.



Summer Squash. -- Four kinds of summer bush squash grow in Alaska. These are Zucchini, Caserta, Cocozelle and straight neck squash. White Bush Scallopsquash matures in some areas.

Squash need light, well drained soil and moderate fertilization. Plant in hills, 5 to 6 seeds to a hill, spaced about two inches apart. Hills need four feet of space between them. Weeding must start early.

Use the squash while it is still immature. If the thumbnail easily punctures the surface skin it is still edible. Summer squash may be stored by freezing or canning. Dry storage is not satisfactory for more than a month.

Swiss Chard. -- Swiss chard is a large foliage beet with juicy leaf stalks and broad crisp leaves. The red kind, called rhubarb chard, is colorful in spring salads. Seed of green chard is more easily obtained. Either kind is a good green vegetable.

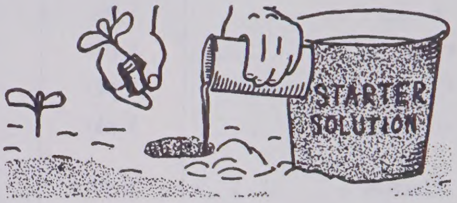
Swiss chard goes to seed, especially when it is planted early and is too crowded in a row. It is grown like beets, thinned 6 to 8 inches apart while still in the seedling stage.

Pick the big tender leaves and leaf stalks. Chop with a pair of shears and boil like spinach. Frozen chard is superior to canned.

Tomatoes. -- South of Fairbanks, few garden sites are warm enough to grow good tomatoes. The vines grow, the plants bloom and set fruit, but the fruit does not usually ripen. Many gardeners harvest green tomatoes for pickling or spicing. There are, of course, small favored sites in Anchorage and the Matanuska Valley where certain tomato varieties may ripen 3 or 4 years in every five. In most of Alaska tomatoes are usually grown in greenhouses or shelters where they are supplied additional heat (see Extension Publication No. 51, "Greenhouses in Alaska"). In the Tanana Valley and parts of the Yukon Valley where the climate is more continental, a few adapted varieties mature fruit outdoors.

Tomato plants must be started indoors and then transplanted outside. Plants are started 8 to 10 weeks before they are needed. Enough plants may be started in a window box and transplanted to small pots, berry boxes, paper cups, plant bands or flats. Seedlings are first transplanted soon after their true leaves appear. After the danger of frost is past and there is assurance of continued warm weather, tomatoes are again transplanted -- this time into the garden if you are going to try a few outside.

Tomatoes do best on a fertile well drained soil. Use fertilizer sparingly. Too much nitrogen encourages vine growth and fruit will not set.



At setting time the plants are usually 8 to 10 inches high. Leave as large a ball of soil and roots as possible on each plant. Set them in position with the earth packed about them. Be careful not to injure their roots.

Hoe around tomatoes to control weeds. Deep hoeing injures their shallow roots. Tomatoes need a lot of water, especially when the vines are growing rapidly. Water the soil, not the vines. Uniform moisture is needed. Wide variations in soil moisture damage the fruit. Blossom end rot is often seen after a period of rank growth. It is a sign of improper watering.

Mature tomato vines may be covered with plastic to hasten ripening of their fruit. Fruit that is nearly mature can be brought into the house for final ripening.

Turnips. -- Turnips are hardy and easy to grow. Plant early for summer eating. No special soil preparation is needed. A late planting in mid-July gives better turnips for winter storage. Thin while tops are still tender. These young turnips make excellent greens. After thinning the turnips should have at least 4 inches of space between them in the row. Pull, clean and wax turnips before they turn woody for best winter storage.

PLANTING GUIDE

Planting distance and expected yield for a 100-foot row.

VEGETABLE	SEED NEEDED	ROW SPACE	PLANT SPACE	SEED DEPTH	DAYS TO MATURE	USUAL YIELD	APPROX. NO. FT. REQUIRED
		INCHES					
Beans, bush	1 lb	24	6	½	85	75 lbs	42
Beets	1 oz	12	2	½	60	2 bus	30
*Broccoli	1 pkt	24	18	½	65	75 lbs	10
*Brussels sprouts	1 pkt	18	18	½	80	50 qts	6
*Cabbage	1 pkt	18	15	½	95	75 hds	17
Carrots	½ oz	18	2	½	125	150 lbs	27
*Cauliflower	1 pkt	18	15	½	75	150 lbs	15
*Celery	1 pkt	24	8	½	110	180 lbs	5
Chard	½ oz	24	6	½	70	100 lbs	10
Collard	¼ oz	18	14	½	110	200 lbs	6
**Cucumber	½ oz	24	24	¾	75	200 lbs	13
**Eggplant	1 oz	24	24	¾	80	100 lbs	5
Kale	1 pkt	18	10	½	80	100 lbs	12
Endive	1 pkt	18	12	¼	80	75 lbs	6
Kohlrabi	½ oz	16	6	¼	80	100 lbs	6
*Lettuce, Head	½ oz	18	12	¼	65	80 hds	11
Lettuce, leaf	1 pkt	16	6	¼	45	10 bus	3
Mustard greens	1 pkt	12	6	¼	45	10 bus	3
*Onion seed, scallion	½ oz	12	1	½	65	100 lbs	10
Onion sets	2 lbs	12	3	2	90	100 lbs	28
Parsley	1 pkt	16	4	¼	75	3 bus	
Parsnips	½ oz	16	3	½	100	100 lbs	11
Peas	1 lb	24	1	1	70	25 lbs	100
**Peppers	1 pkt	24	24	½	65	100 lbs	6
Potatoes	15 lbs	36	12	2	100	150 lbs	70
Radish	1 oz	12	1	½	30	70 lbs	7
Rutabagas	½ oz	18	8	½	88	200 lbs	12
Spinach	1 oz	24	8	½	60	80 lbs	14
Squash	½ oz	48	24	1	55	100 lbs	16
**Tomatoes	1 pkt	24	24	½	65	200 lbs	15
Turnips	¼ oz	16	4	½	50	300 lbs	11

* There may be started indoors for later transplanting, or they may be seeded directly into the garden.
** These are usually grown in greenhouses.

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IMPORTANT

WHEN USING CHEMICALS FOR INSECT OR WEED CONTROL ALWAYS READ AND CAREFULLY FOLLOW THE DIRECTIONS ON THE CONTAINER. MANY CHEMICALS CAN BE POISONOUS IF IMPROPERLY USED. IT IS ILLEGAL TO STORE OR SELL INSECTICIDES OR WEEDICIDES EXCEPT IN PROPERLY LABELED CONTAINERS.

THE HOME GARDEN CAN BE AN IMPORTANT PART OF EACH FAMILIES PREPARATION FOR EMERGENCIES. ALWAYS CONSIDER THE GROWING AND STORAGE OF SUITABLE GARDEN PRODUCE AS PART OF THE HOME EMERGENCY FOOD SUPPLY. REFER TO U.S. DEPARTMENT OF AGRICULTURE HOME AND GARDEN BULLETIN NO. 77 FOR MORE DETAILS.